

3.9 Air Quality

This section discusses potential air quality impacts from the Proposed Action and alternatives. This discussion describes the affected environment/environmental setting, analysis methods, significance criteria, and impacts for each of the alternatives. Appendix M provides a summary of the existing emission sources and monitoring data, detailed emission calculation methodologies, and detailed emission inventories.

3.9.1 Area of Analysis

The area of analysis includes multiple counties in northern California and southern Oregon. Direct air quality impacts from the Proposed Action and alternatives would be limited to Siskiyou County, California and Klamath County, Oregon for dam removal activities, while additional impacts could occur in Jackson County, Oregon and Shasta County, California from haul truck or construction worker travel. The quantitative analysis for the alternatives was limited to these four counties.

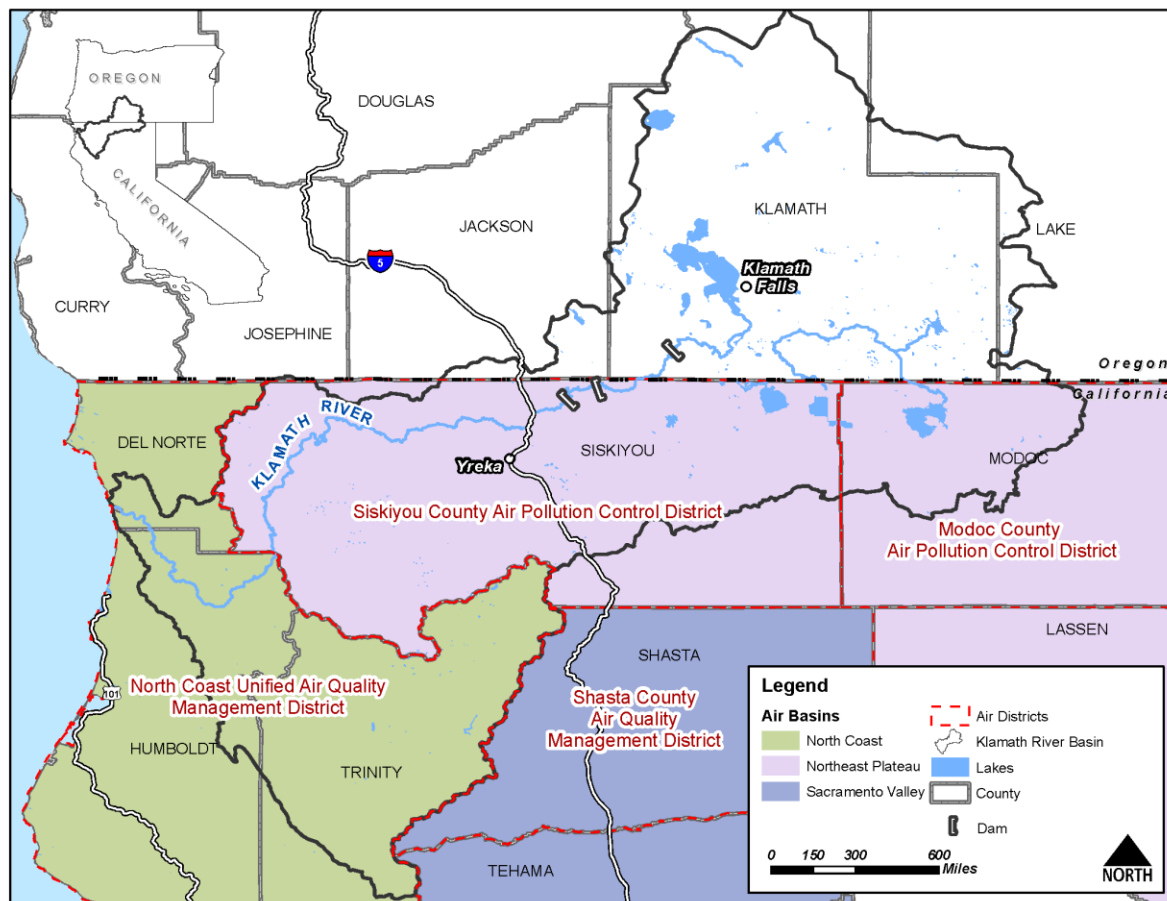
The area of analysis includes the Curry County in Oregon and Del Norte, Humboldt, Modoc and Trinity counties in California for a qualitative analysis of the impacts that would be caused by implementation of programmatic elements of the alternatives.

California is divided into fifteen different air basins based on common geographic and political boundaries. The North Coast, Northeast Plateau, and Sacramento Valley Air Basins cover the portion of the Klamath Basin within California. The geographic scope of the analysis also includes the jurisdictions of the North Coast Unified Air Quality Management District, the Siskiyou County Air Pollution Control District, the Modoc County Air Pollution Control District, and the Shasta County Air Quality Management District. Figure 3.9-1 identifies the air quality area of analysis.

3.9.2 Regulatory Framework

The Klamath Falls, Oregon Nonattainment Area is designated as a nonattainment area for fine particulate matter <2.5 microns ($PM_{2.5}$), while the Klamath Falls Urban Growth Boundary (UGB) is designated as a maintenance area for carbon monoxide (CO) and inhalable particulate matter <10 microns (PM_{10}). Additionally, the Medford-Ashland Air Quality Maintenance Area (AQMA) is designated as a maintenance area for PM_{10} and CO. As a result, the following de minimis thresholds for general conformity apply to these two urban areas:

- $PM_{2.5}$ (nonattainment): 100 tons per year
- Sulfur dioxide (SO_2) (as $PM_{2.5}$ precursor): 100 tons per year
- Nitrogen oxides (NO_x) (as $PM_{2.5}$ precursor): 100 tons per year
- CO (maintenance): 100 tons per year
- PM_{10} (maintenance): 100 tons per year



Source: California Air Resource Board (CARB) 2010a.

Figure 3.9-1. Area of Analysis for both KHSA and KBRA

Air quality management and protection responsibilities are regulated by federal, state, tribal, and local levels of government, which are listed below.

3.9.2.1 Federal Authorities and Regulations

- Clean Air Act (40 CFR 50-88)
- General Conformity (40 CFR 93, Subpart B)

3.9.2.2 State Authorities and Regulations

- California Clean Air Act (H&S Code, §39000 et seq.)
- Oregon Administrative Rules (Chapter 340, Divisions 200-268)
- Oregon Revised Statutes (Chapter 468A)
- Medford Maintenance Plan for CO (Oregon Department of Environmental Quality [ODEQ] 2001)

- Klamath Falls PM₁₀ Maintenance Plan (ODEQ 2002)
- Medford-Ashland AQMA PM₁₀ State Implementation Plan (ODEQ 2004)

3.9.2.3 Local Authorities and Regulations

- Siskiyou County Air Pollution Control District
- Modoc County Air Pollution Control District
- Shasta County Air Quality Management District
- North Coast Unified Air Quality Management District (Del Norte, Humboldt, and Trinity Counties)
- Klamath County Clean Air Ordinance (Ordinance No. 63.05)

3.9.2.4 Tribal Air Quality Management

- Karuk Tribe *Eco-Cultural Resources Management Plan* (2010)
- Yurok Tribe Air Quality Ordinance

3.9.3 Existing Conditions/Affected Environment

Siskiyou County, California is dominated by volcanic peaks (e.g., Mount Shasta) and forested mountains. The county is sparsely populated. Agricultural activities (including rangeland) are primarily in areas that are not wooded. The climate generally features hot summer days with cool nights and mild winters in the low valleys. The mountainous areas have cool summers and severe winters. Various recreational activities and hunting also occur in Siskiyou County.

Klamath County is generally characterized by high desert prairie with a variety of mountain ranges and isolated peaks. As with Siskiyou County, the area is largely rural and agricultural, while recreation and hunting activities dominate.

3.9.3.1 Existing Air Quality Conditions

The air quality conditions for the area are typically the result of existing emission sources in the area and meteorological conditions that affect the dispersion of the emissions once they enter the atmosphere.

Attainment Designations

Regions are designated as nonattainment, maintenance, or attainment areas with respect to the various National and California ambient air quality standards, based on their compliance with the standards. A nonattainment area is defined as a region that does not meet the federal or state ambient air quality standards. Maintenance areas are those areas that previously did not meet the air quality standards (i.e., nonattainment), but are now consistently meeting the requirements. If an area consistently meets the air quality standards, then it is designated as an attainment area. The affected counties in California are all currently designated as a federal attainment area for all pollutants. The Klamath Falls UGB in Oregon is designated as a maintenance area for CO and PM₁₀; the Medford-Ashland AQMA is designated as a maintenance area for CO and PM₁₀; and the Klamath

Falls Nonattainment Area is designated as a nonattainment area for PM_{2.5}. Table 3.9-1 presents the attainment designations for each of the federal criteria air pollutants.

Table 3.9-1. Federal Attainment Status of the Study Area

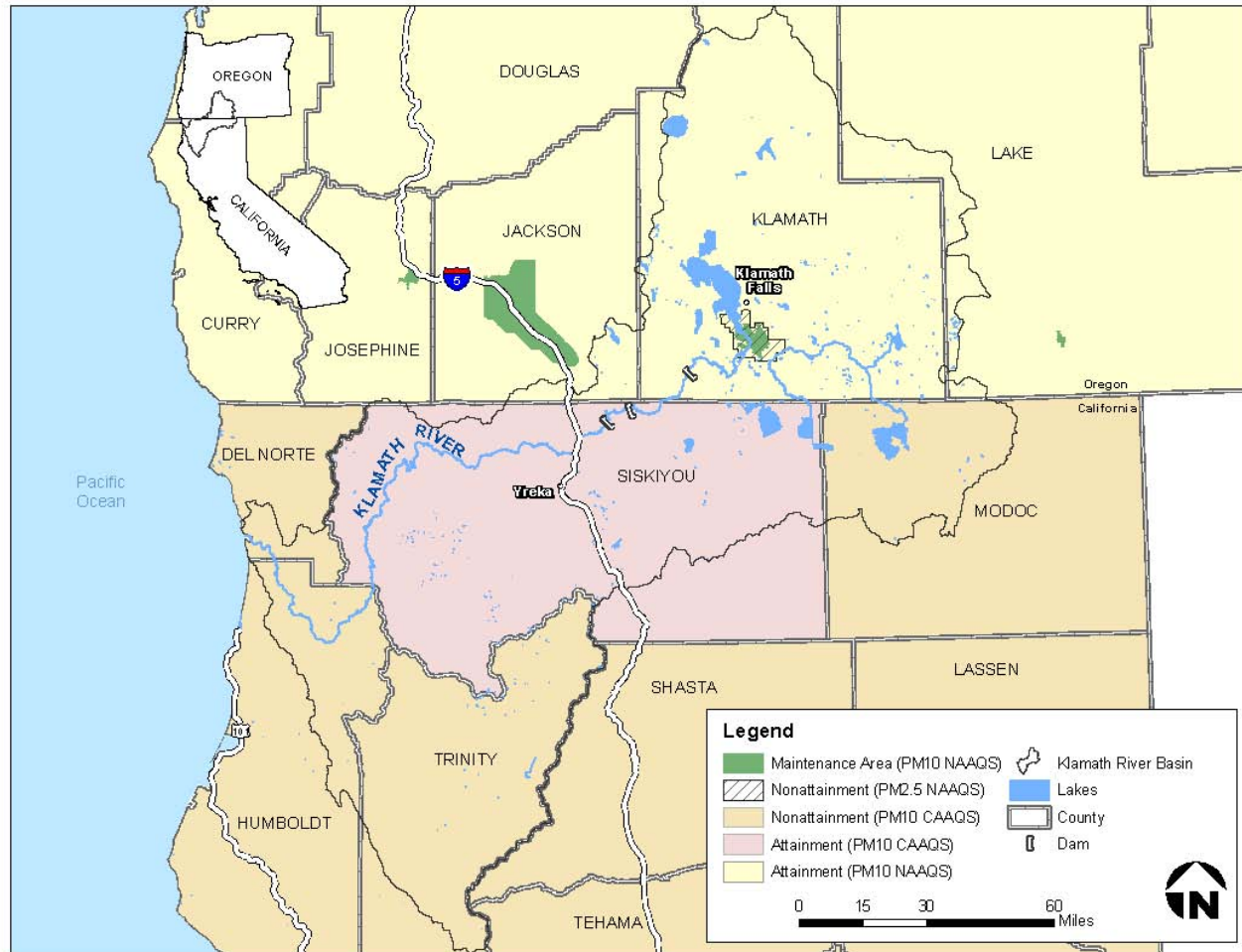
Pollutant	Federal Status
Ozone (O ₃)	Attainment
Inhalable particulate matter (PM ₁₀)	Maintenance (Klamath Falls UGB and Medford-Ashland AQMA) Attainment (all other areas)
Fine particulate matter (PM _{2.5})	Nonattainment (Klamath Falls Nonattainment Area) Attainment (all other areas)
Carbon monoxide (CO)	Maintenance (Klamath Falls UGB and Medford-Ashland AQMA) Attainment (all other areas)
Nitrogen dioxide (NO ₂)	Attainment
Sulfur dioxide (SO ₂)	Attainment

Source: United States Environmental Protection Agency (USEPA) 2010a; OAR 340-204.

AQMA: Air Quality Maintenance Area

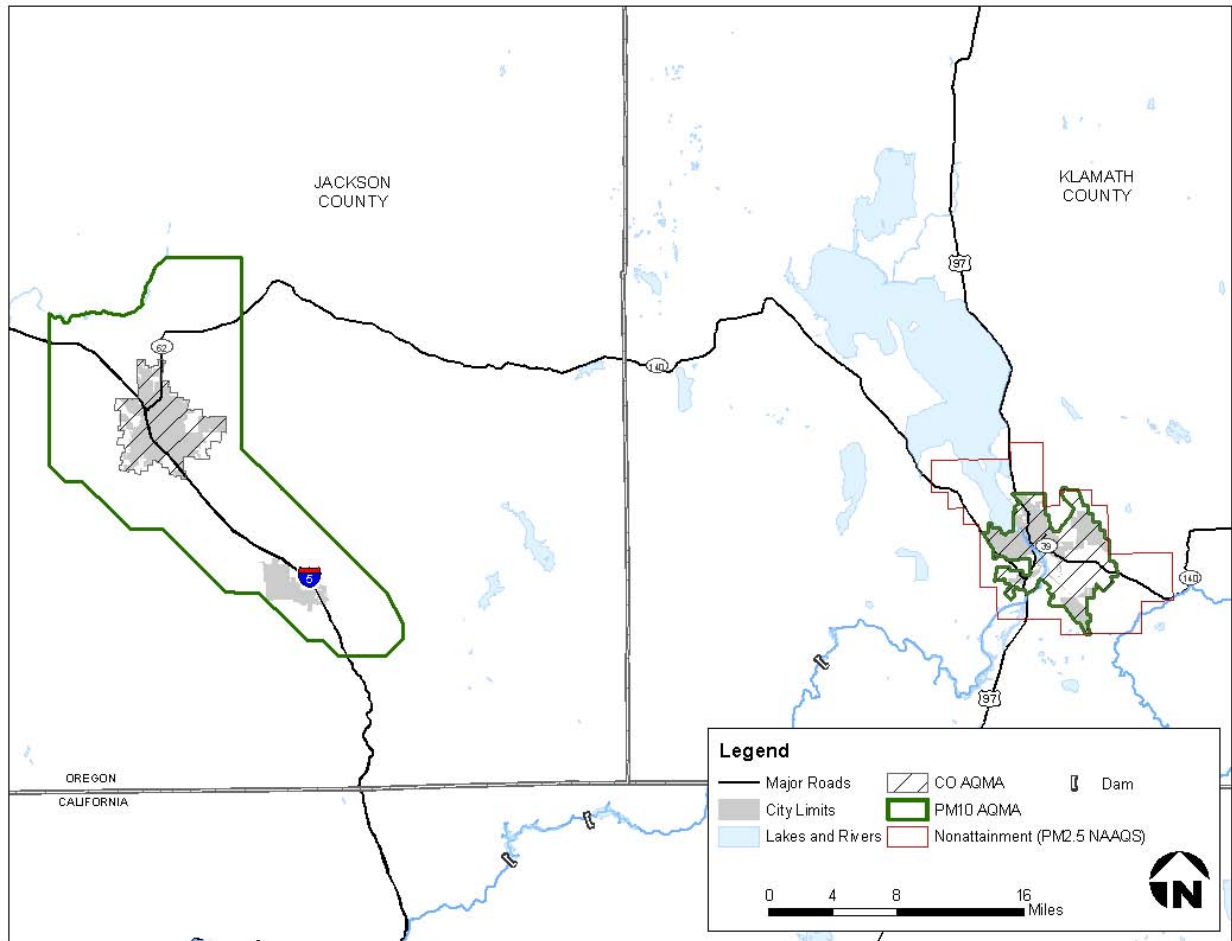
UGB: urban growth boundary

The J.C. Boyle Dam is in Klamath County and not in the Klamath Falls UGB or the Klamath Falls PM_{2.5} Nonattainment Area; therefore, the dam is in an area that is designated an attainment area for all pollutants. The Medford-Ashland AQMA is currently a maintenance area for the PM₁₀ and CO National Ambient Air Quality Standards (NAAQS). Although this area is outside of the Klamath Basin, trucks and/or construction workers could travel through this region. Figure 3.9-2 shows the location of particulate matter (PM₁₀ and PM_{2.5}) nonattainment and maintenance areas for the NAAQS in relation to the Klamath Basin. Figure 3.9-3 shows the Klamath Falls UGB, the Klamath Falls Nonattainment Area, and the Medford-Ashland AQMA.



Source: California Air Resources Board (CARB) 2010a; United States Environmental Protection Agency (USEPA) 2010b.

Figure 3.9-2. Particulate Matter (PM₁₀ and PM_{2.5}) NAAQS and CAAQS Designations



Source: Oregon Department of Environmental Quality 2008

Figure 3.9-3. Particulate Matter (PM₁₀ and PM_{2.5}) and Carbon Monoxide (CO) NAAQS Designations in Oregon

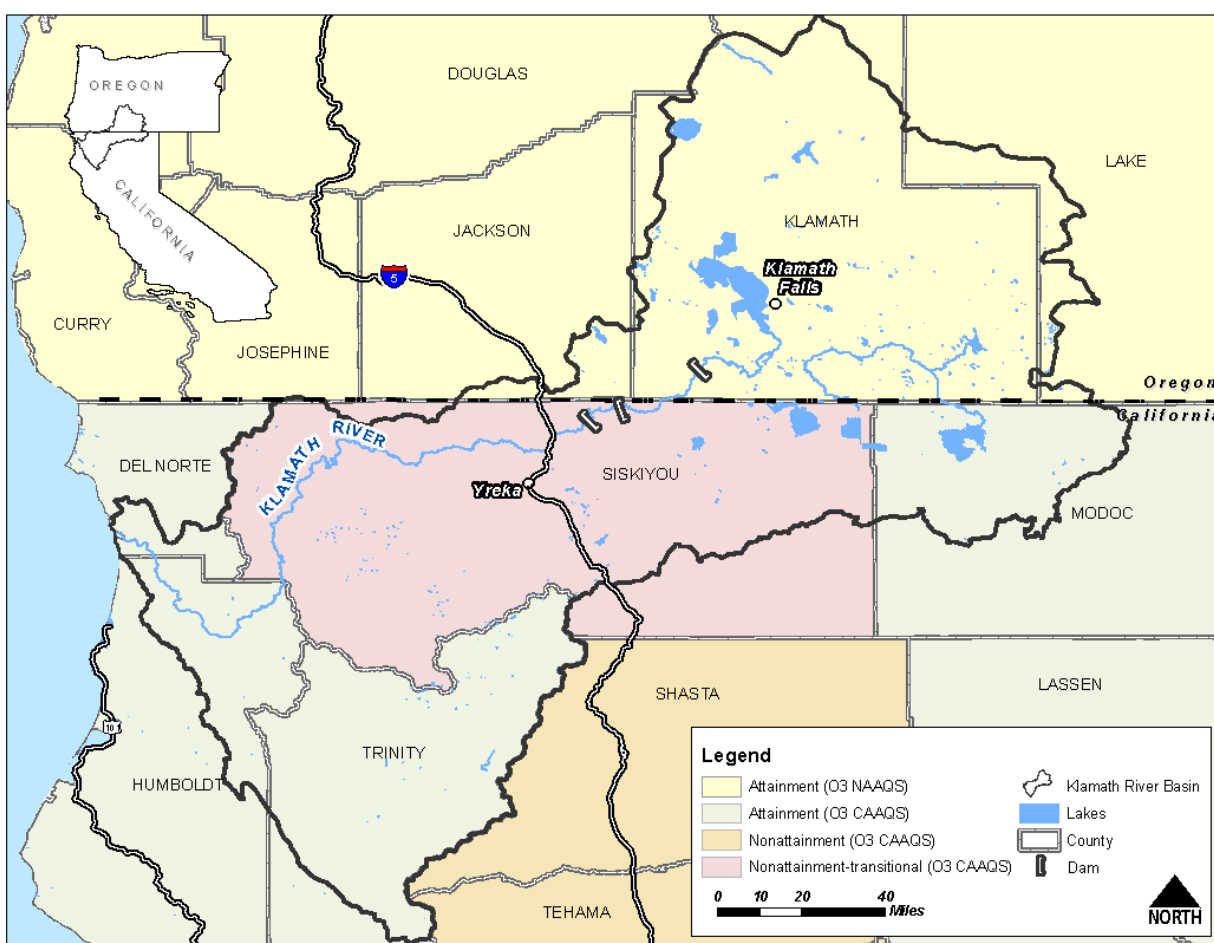
Siskiyou County is currently a nonattainment-transitional area¹ for the California ozone (O₃) standard, whereas Shasta County is a nonattainment area for the state O₃ California Ambient Air Quality Standard (CAAQS). All other California counties within the Klamath Basin are in attainment of the O₃ CAAQS. Siskiyou County is in attainment of the California PM₁₀ standards, but the other California counties in the Klamath Basin are in nonattainment of the PM₁₀ CAAQS. All California counties in the project area are in attainment of the PM_{2.5}, CO, nitrogen dioxide (NO₂), and SO₂ CAAQS. Table 3.9-2 lists the attainment status for each pollutant with regard to CAAQS. Figure 3.9-2 identifies the attainment status for the PM₁₀ CAAQS and Figure 3.9-4 identifies the attainment status for the O₃ CAAQS.

¹ An area classified “nonattainment-transitional” for O₃ has had three or fewer exceedances at each site during the last year. This classification means that the area is close to attaining the standard for the given pollutant.

Table 3.9-2. California Air Quality Attainment Status for the Study Area

Pollutant	California Status
Ozone (O ₃)	Nonattainment-Transitional (Siskiyou County) Nonattainment (Shasta County) Attainment (Del Norte, Humboldt, Modoc, and Trinity Counties)
Inhalable particulate matter (PM ₁₀)	Attainment (Siskiyou County) Nonattainment (Del Norte, Humboldt, Trinity, Shasta, and Modoc Counties)
Fine particulate matter (PM _{2.5})	Attainment/Unclassified (All counties)
Carbon monoxide (CO)	Attainment/Unclassified (All counties)
Nitrogen dioxide (NO ₂)	Attainment (All counties)
Sulfur dioxide (SO ₂)	Attainment (All counties)

Source: CARB 2010b.



Source: CARB 2010a; United States Environmental Protection Agency (USEPA) 2010b.

Figure 3.9-4. Ozone (O₃) NAAQS and CAAQS Designations

3.9.4 Environmental Consequences

3.9.4.1 *Environmental Effects Determination Methods*

This analysis uses estimates of emissions that would occur from the removal of the dams or the installation of fish passage structures. These estimates came from a variety of emissions models and spreadsheet calculations:

- CARB Urban Emissions (URBEMIS) model, Version 9.2.4 (fugitive dust calculations from construction equipment, cut/fill activities, and building demolition)
- CARB EMFAC2007 model (on-road vehicle emissions factor model for California)
- United States Environmental Protection Agency (USEPA) MOBILE6.2² (on-road vehicle emissions factor model for Oregon)
- CARB OFFROAD2007 (off-road vehicle emissions factor model for California)
- USEPA NONROAD2008a (off-road vehicle emissions factor model for Oregon)
- Midwest Research Institute (1996), *Improvement of Specific Emission Factors* (paved road dust emissions)
- *Compilation of Air Pollutant Emission Factors (AP-42)* (USEPA 2006)

Appendix M provides detailed information on the emission calculations.

3.9.4.2 *Significance Criteria*

For the purposes of this analysis, an air quality impact would be significant if one or more of the following criteria are met:

- The effects would cause an air quality standard to be violated
- Activities or emissions would result in a cumulatively considerable net increase of:
 - O₃ in Siskiyou County or Shasta County, California (O₃ nonattainment-transitional and nonattainment areas, respectively)
 - PM₁₀ in Del Norte, Humboldt, Trinity, Shasta, and Modoc Counties (PM₁₀ nonattainment areas)
- Cause release of emissions that exceed 250 pounds per day for NO_x, volatile organic compounds (VOC), PM₁₀, PM_{2.5}, or sulfur oxides (SO_x); or 2,500 pounds per day for CO (Siskiyou County Air Pollution Control District Rule 6.1)
- Expose sensitive receptors to substantial pollutant concentrations (defined by pollutant thresholds)
- Activities or emissions would be inconsistent with Oregon's Regional Haze Plan (ODEQ 2009)

² Although the USEPA recently developed the Motor Vehicle Emission Simulator (MOVES) to replace MOBILE6.2, MOVES has only been approved for use in SIPs and Transportation Conformity (75 FR 9411). Because it has not yet been approved for project-level analyses, MOBILE6.2 was used to estimate emissions from on-road vehicles in Oregon.

- Activities or emissions would be inconsistent with California’s Regional Haze Plan (CARB 2009)

The Proposed Action would also occur within close proximity (within 100 kilometers³) of several mandatory federal Class I areas, which are areas in which visibility was declared by Congress to be an important value (Clean Air Act, Section 169A). The following Class I areas could be affected by the Proposed Action or its alternatives.

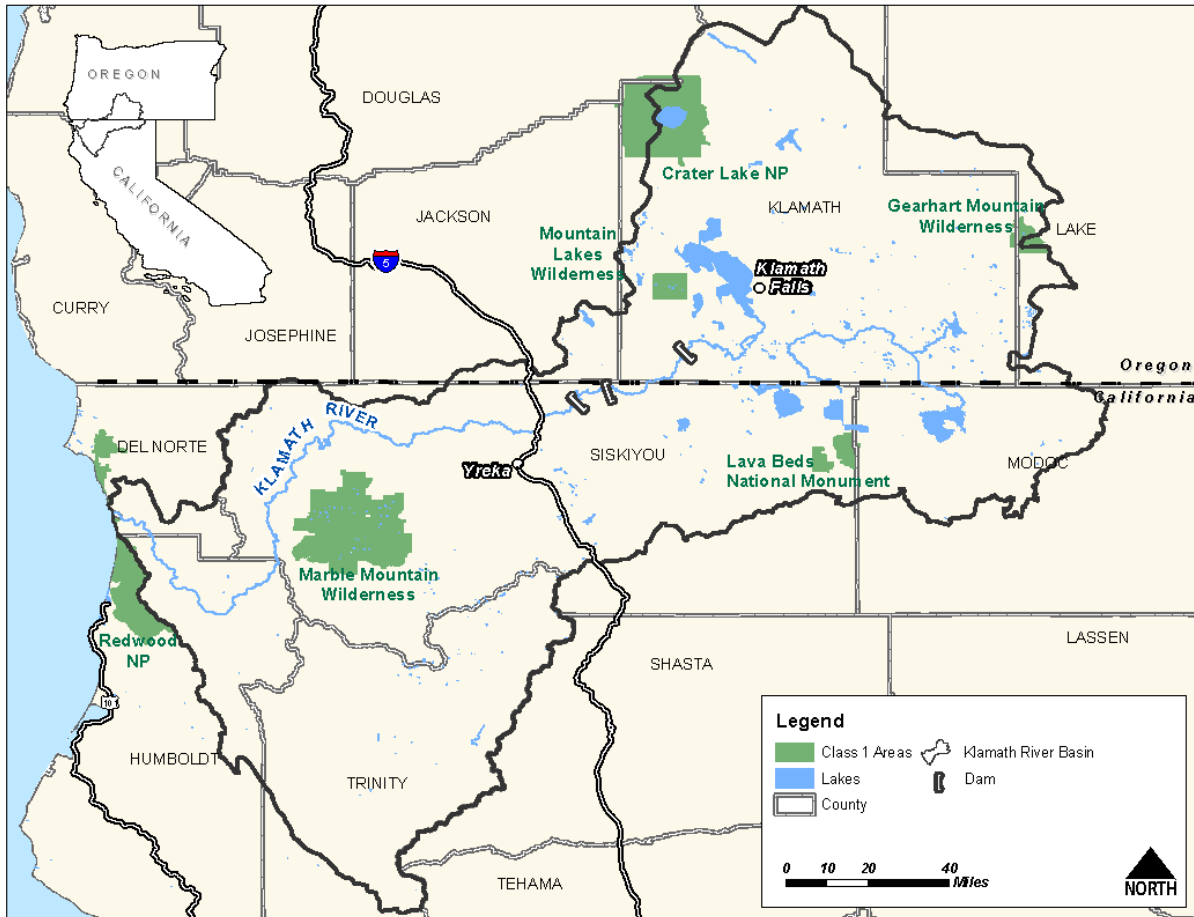
- Crater Lake National Park (Oregon)
- Gearhart Mountain Wilderness (Oregon)
- Lava Beds National Monument (California)
- Marble Mountain Wilderness (California)
- Mountain Lakes Wilderness (Oregon)

Oregon’s *Regional Haze Plan* (ODEQ 2009) indicates that the current rules addressing construction-related activities in Oregon are sufficient to prevent visibility impairment in Oregon Class I areas. Several rules that address construction activities include Oregon Administrative Rule (OAR) 340-208-0110, which sets opacity limits for visible emissions from any air contaminant source and OAR 340-208-0210, which addresses fugitive emissions from a variety of sources.

California’s *Regional Haze Plan* (CARB 2009) indicates that CARB’s In-Use Off-Road Diesel Vehicle Regulation (adopted on July 26, 2007) will reduce particulate matter and NOx emissions by 74 percent and 32 percent, respectively, from current levels. CARB expects this measure to be sufficient to mitigate visibility impacts from construction activities.

Figure 3.9-5 shows the Federal Class I areas that are within the Klamath Basin.

³ The 100-kilometer distance is based on a memorandum from the USEPA (1979) to Regional Administrators that indicated that “[v]ery large sources...may be expected to affect ‘air quality related values’ at distances greater than 100 kilometers.” Although the distance is related to the Prevention of Significant Deterioration permitting program, the distance is being used as a proxy for activities associated with the Proposed Action.



Source: National Park Service 2010.

Figure 3.9-5. Federal Class I Areas

3.9.4.3 Effects Determinations

No operational sources are part of the Proposed Action; therefore, this analysis considers only construction-related air quality impacts. Appendix M describes the methods by which construction impacts were estimated.

Alternative 1: No Action/No Project Alternative

Vehicle exhaust from continued maintenance and operation of the Four Facilities could cause emissions of air pollutants. Under the No Action/No Project Alternative, none of the activities under the KHSRA would be completed. Operational emissions that would occur from employees commuting to the Four Facilities, vendor trips, or other emission sources would continue to occur under the No Action/No Project Alternative. **These emissions are expected to be minimal and were not quantified for this analysis.**

Activities associated with Interim Measures (IMs) could result in short-term and temporary increases in criteria pollutants from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance. Several IMs would be implemented under the No Action/No Project Alternative. Several of these measures could result in increased criteria pollutant emissions:

- IM 7: J.C. Boyle Gravel Placement and/or Habitat Enhancement
- IM 8: J.C. Boyle Bypass Barrier Removal

IM 7 would require PacifiCorp to place suitable gravels in the J.C. Boyle Bypass and Peaking reaches using a passive approach before high flow periods or to provide for other habitat enhancement. The No Action/No Project Alternative includes only one year of this measure. Criteria pollutant emissions could occur from trucks hauling gravel to the J.C. Boyle Bypass and Peaking reaches; however, the number of trucks required to deliver gravel is expected to be minor.

IM 8 requires the removal of the sidecast rock barrier located approximately 3 miles upstream of the J.C. Boyle Powerhouse in the J.C. Boyle Bypass Reach. Potential air quality emissions are expected to be less than those quantified for the removal of Copco 1 from blasting activities.

Based on the limited amount of construction equipment expected to be used simultaneously, peak daily emissions are not expected to exceed the significance criteria described previously. **The impact on air quality from implementation of the IMs would be less than significant.**

Ongoing Restoration Activities

Construction activities from several ongoing restoration actions could cause emissions of air pollutants. Under the No Action/No Project Alternative, several projects would be assumed to proceed over time. These resource management actions could receive additional funding and could be expanded or accelerated through the KBRA; however, they were started or under consideration before the KBRA was developed and would move forward even without the KBRA. The Fish Habit Restoration activities could result in criteria pollutant emissions. **This project would involve some limited construction activities that could result in short-term temporary air emissions in the upper basin. The effects of these activities would be fully analyzed in separate National Environmental Policy Act evaluations for each project as they are designed.**

Alternative 2: Full Facilities Removal of Four Dams (Proposed Action)

Vehicle exhaust and fugitive dust emissions from dam removal activities could increase emissions of VOC, NO_x, CO, SO₂, PM₁₀, and PM_{2.5} to levels that could exceed Siskiyou County's thresholds of significance. Emission sources include exhaust emissions from off-road construction equipment, on-road trucks, construction worker employee commuting vehicles; and fugitive dust emissions from unpaved roads and general earth moving activities. General earth moving activities that could generate fugitive dust include the operation of construction equipment on the site and removal of excavated

materials (cut/fill activities). The Iron Gate Fish Hatchery would be operated for eight years after the dam removal, but the hatchery would not be rebuilt or relocated. While additional water may be routed to the hatchery to support its operation, an increase in emissions would not occur. Operational emissions were therefore not estimated for the hatchery.

Table 3.9-3 summarizes predicted uncontrolled peak daily and annual emission rates for VOC, NO_x, CO, SO₂, PM₁₀, and PM_{2.5} for the Proposed Action. This analysis uses the conservative assumption that the peak day of construction could occur at the same time for each dam; therefore, the peak daily emissions are additive. The analysis assumes that dust control measures like watering and erosion control fabrics would be required by the United States Department of the Interior (DOI). In addition, the calculations assume that all haul roads would be covered in gravel with minimal silt content. As a result, these measures are included as part of the project and are not considered to be mitigation measures.

Cofferdams would be constructed at the Four Facilities during deconstruction activities. Concrete rubble, rock, and earthen materials that would come from the dam removal activities would be used as possible to construct the cofferdams. Since the cofferdams would be constructed from materials salvaged from the dam demolition activities, emissions associated with construction would already be included in the emissions inventory. Additional emissions could occur when the cofferdams are later demolished, but this activity would not cause any changes to the significance determinations.

As Table 3.9-3 shows, total emissions of NO_x and PM₁₀ exceed the significance criteria for the four sites. The greatest source of NO_x emissions from each of the dams would be off-road construction equipment, followed by on-road trucks, and then employee commuting vehicles. The major sources of PM₁₀ emissions would be fugitive dust from unpaved roads and then cut/fill activities. Any adverse impacts would be temporary.

Table 3.9-3. Uncontrolled Emissions Inventories for the Proposed Action

Location	Peak Daily Emissions (pounds per day) ¹					
	VOC	CO	NOx	SO ₂	PM ₁₀	PM _{2.5} ²
Iron Gate	67	272	348	2	210	50
Copco 1	27	176	129	1	174	165
Copco 2	22	83	113	1	17	6
J.C. Boyle	15	54	60	5	103	27
Grand Total	131	584	650	9	503	248
California Total ³	116	531	590	4	401	221
Oregon Total	15	54	60	5	103	27
Significance Criterion ⁴	250	2,500	250	250	250	250
Annual Emissions (tons per year) – 2020						
Iron Gate	3	11	14	<1	10	2
Copco 1	1	7	5	<1	8	7
Copco 2	1	3	5	<1	<1	<1
J.C. Boyle	1	3	5	<1	3	1
Total (2020)	6	24	28	1	20	11
California Total ³	5	21	23	<1	18	10
Oregon Total	1	3	5	<1	3	1
De Minimis Threshold ⁵	n/a	100	100	100	100	100

Notes:

¹ Values shown in **bold** are significant.

² Where emission factors were only provided for PM₁₀, appropriate PM size profiles were used to estimate PM_{2.5} emissions. Appendix M includes detailed calculation tables.

³ California total includes emissions for activities at Iron Gate, Copco 1, and Copco 2 Dams.

⁴ Based on Siskiyou County Air Pollution Control District Rule 6.1 permitting thresholds.

⁵ General conformity de minimis thresholds from 40 CFR 93.153.

Key:

VOC = volatile organic compounds

CO = carbon monoxide

NOx = nitrogen oxides

SO₂ = sulfur dioxide

PM₁₀ = inhalable particulate matter

PM_{2.5} = fine particulate matter

Demolition of Copco 1 dam could generate concrete dust, which has a high pH. Dust control measures as described in mitigation measure AQ-4 would be used to control concrete dust to the maximum extent feasible. Management of the high pH content is discussed further in Section 3.5, Terrestrial Resources. **The impact on air quality from emissions of NOx and PM₁₀ from the demolition of the Four Facilities would be a significant impact. Implementation of mitigation measures AQ-1 through AQ-4 would reduce emissions of NOx to a less than significant level; however, emissions of PM₁₀ would remain significant and unavoidable.**

Construction of a new, elevated City of Yreka water supply pipeline and steel pipeline bridge to support the pipe above the river could result in short-term and temporary increases in criteria pollutant emissions from vehicle exhaust and fugitive dust that could

exceed Siskiyou County's thresholds of significance. On- and off-road construction equipment would be used to complete the relocation and construction of the Yreka water supply pipeline. These construction activities would occur before demolition activities at Iron Gate and would not overlap with other construction or demolition activities. Typical equipment that would be expected to be used to complete construction of the pipeline would include excavators, graders, loaders, and scrapers. Based on the limited amount of construction equipment expected to be used simultaneously, peak daily emissions are not expected to exceed the significance criteria described previously. **The impact on air quality from the construction of the Yreka water supply pipeline would be less than significant.**

Activities associated with several IMs could result in short-term and temporary increases in criteria pollutants from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance. Prior to construction, IMs as described in the KHSa (KHSa Section 1.2.4) would be implemented and would control operations of the hydroelectric facilities. Several of the IMs in the Proposed Action could result in increased criteria pollutant emissions:

- IM 7: J.C. Boyle Gravel Placement and/or Habitat Enhancement
- IM 16: Water Diversions

IM 7 would require PacifiCorp to place suitable gravels in the J.C. Boyle bypass and peaking reach using a passive approach before high flow periods or to provide for other habitat enhancement. The Proposed Action includes seven years of implementing this measure. Criteria pollutant emissions could occur from trucks hauling gravel to the J.C. Boyle bypass and peaking reach; however, the number of trucks required to deliver gravel is expected to be minor.

IM 16 would eliminate three screened diversions from Shovel and Negro Creeks and would also require the installation of screened irrigation pump intakes, as necessary, in the Klamath River. Limited construction equipment and haul trucks would be required to remove the screened diversions or to construct new diversions.

Based on the limited amount of construction equipment expected to be used simultaneously, peak daily emissions are not expected to exceed the significance criteria described previously. **The impact on air quality from implementation of the IMs would be less than significant.**

Restoration actions could result in short-term and temporary increases in criteria pollutant emissions from vehicle exhaust and fugitive dust from the use of helicopters, trucks, and barges. Following drawdown of the reservoirs, revegetation efforts would be initiated to support establishment of native wetland and riparian species on newly exposed sediment. Upper areas would be reseeded from a barge until the reservoir levels become too low to operate and access the barge. Aerial application would be necessary for precision applications of material near sensitive areas and the newly established river

channel. Aerial hydroseeding is scheduled to begin on March 15, 2020 and last for 10 days at Iron Gate and 20 days at Copco. Trucks would also be used as necessary to provide seeding. Additional fall seeding may be necessary to supplement areas where spring hydroseeding was unsuccessful. These revegetation actions would be happening simultaneously to the demolition of the Four Facilities; therefore, emissions would contribute to those already occurring for the Proposed Action. **Helicopters, trucks, and barges from restoration actions would cause a temporary significant air quality impact and would increase the significant air quality impacts generated by dam deconstruction in and around the dam sites. Available mitigation measures would not reduce emissions to less than significant levels; therefore, emissions would remain significant and unavoidable.**

Relocation and demolition of various recreation facilities could result in short-term and temporary increases in criteria pollutant emissions from vehicle exhaust and fugitive dust. The demolition of the Four Facilities would change recreational opportunities from lake-based recreation to river-based recreation. This change would require several recreation facilities to be relocated or demolished. On- and off-road construction equipment would be used to complete these activities, which would occur after the dam demolition actions. Furthermore, although there are multiple recreation facilities being demolished or relocated, the facilities would likely not be removed simultaneously. Based on the limited size of each recreation facility, typical equipment to be used during construction activities would include dozers, scrapers, loaders, and graders. The amount of equipment expected to be used simultaneously is expected to be minimal; therefore, peak daily emissions are not expected to exceed the significance criteria described previously. **The impact on air quality from the relocation and demolition of the various recreation facilities would be less than significant.**

Vehicle exhaust and fugitive dust emissions from dam removal activities could exceed the de minimis thresholds in 40 CFR 93.153 that would require the development of a general conformity determination. Emissions from trucks and employee commuting could occur within the Klamath Falls UGB, the Klamath Falls Nonattainment Area (PM_{2.5}), or the Medford-Ashland AQMA; therefore, emissions that would occur within these areas are subject to the requirements of general conformity. If the total of direct and indirect emissions are below the general conformity de minimis thresholds in 40 CFR 93.153, then no further action is needed and a general conformity determination is not required.

While only emissions that would occur within the designated nonattainment or maintenance areas would be subject to general conformity, it is not possible to separate those emissions from the project total. As a result, total emissions from haul trucks and employee commuting was compared to the general conformity de minimis thresholds as a conservative analysis. Emissions from trucks and employee commuting are less than the general conformity de minimis thresholds identified in Section 3.9.2.1 (see Table 3.9-3) and therefore a conformity determination is not necessary for any of the maintenance or nonattainment areas. **As a result, a general conformity determination is not required.**

Fugitive dust emissions from demolition activities could impair visibility in Federal Class I areas. Demolition activities would be conducted in compliance with Oregon and California regulations related to fugitive dust emissions. In addition, any fugitive dust emissions would be short-term and temporary and would not have long-term effects related to visibility. **Impacts related to visibility would be less than significant.**

Keno Transfer

Implementation of the Keno Transfer could have adverse effects on air quality. The Keno Transfer is a transfer of title for the Keno Facility from PacifiCorp to the DOI. This transfer would not result in the generation of new impacts on air quality compared with existing facility operations. Following transfer of title, DOI would operate Keno in compliance with applicable law and would provide water levels upstream of Keno Dam for diversion and canal maintenance with agreements and historic practice (KHSa Section 7.5.4). **Therefore, implementation of the Keno Transfer would result in no change from existing conditions.**

East and West Side Facility Decommissioning

Decommissioning the East and West Side Facilities could cause adverse air quality effects. Decommissioning of the East and West Side canals and hydropower facilities of the Link River Dam by PacifiCorp as a part of the KHSa would redirect water flows currently diverted at Link River Dam into the two canals, back into the Link River. These construction activities would be conducted in the years prior to 2020 and would not overlap with other construction or demolition activities. Peak daily emissions would likely be minimal and are not expected to exceed the significance criteria. **The impact on air quality from the East and West Side Facilities decommissioning action would be less than significant.**

KBRA

The KBRA has several programs that could cause temporary increases in air quality pollutant emissions, primarily from construction activities. The following KBRA programs could cause air quality impacts from the use of heavy equipment:

- Phases I and II Fisheries Restoration Plans
- Fisheries Reintroduction and Management Plan
- Wood River Wetland Restoration Project
- On-Project Plan
- Water Use Retirement Program
- Fish Entrainment Reduction

Construction activities associated with the KBRA programs could result in temporary increases in air quality pollutant emissions from vehicle exhaust and fugitive dust. Potential construction activities include channel construction, mechanical thinning of trees, road decommissioning, fish passage and facilities construction, breaching levees, and fish hauling. Several of these activities would require construction equipment with the potential to emit air quality pollutants. While the exact geographic location and timing of these programs is not known, it is assumed that some could occur at the same

time and in the same area as the hydroelectric facility removal actions analyzed above and could contribute to the severity of the facility removal air quality effects. **Due to the potentially large amount of construction activities that would occur for the various KBRA programs, it is anticipated that the effects from air quality could be significant. Mitigation Measures AQ-1, 2, and 3 would be implemented to reduce the severity of these effects to a less than significant level; however, emissions from any construction actions completed in the same year as hydroelectric facility removal actions may not be reduced to a less than significant level. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.**

Operational activities associated with the Fisheries Reintroduction and Management Plan could result in temporary increases in air quality pollutant emissions from vehicle exhaust associated with trap-and-haul activities. Potential operational emissions could occur from haul trucks moving fish around Keno Impoundment and Link River. Upstream-migrating fish would be collected downstream from Keno Dam and relocated to Upper Klamath Lake or its tributaries. Downstream-migrating fish would be collected at Link River Dam (and the East Side and West Side canals) and relocated downstream from Keno Dam. Seasonal trap and haul operations would occur during periods of poor water quality in Keno Impoundment. Hauling activities would occur after the peak emission-generating period of facility removal because fish cannot access Keno Dam until after removal of the Four Facilities; however, some construction activities associated with completing removal activities and reservoir restoration may occur at the same time as hauling operations. Construction emissions related to dam removal and hauling operations, taken together, could increase the severity of the air quality effects, but the combined emissions would likely still be less than the peak emissions during dam deconstruction. **Although the exact extent and timing of these hauling activities is not known, it is assumed that air quality impacts would be significant because of the long haul distance that is expected. Mitigation Measures AQ-1, 2, and 3 would be implemented to reduce the severity of these effects to a less than significant level; however, emissions from any construction actions completed in the same year as hydroelectric facility removal actions may not be reduced to a less than significant level. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.**

Alternative 3: Partial Facilities Removal of Four Dams Alternative

Under the Partial Facilities Removal Alternative, some of the structures associated with the dams would remain in place. As a result, the area in which removal activities could occur is smaller than under the Proposed Action.

Vehicle exhaust and fugitive dust emissions from dam removal activities could increase emissions of VOC, NO_x, CO, SO₂, PM₁₀, and PM_{2.5} to levels that could exceed Siskiyou County's thresholds of significance. As it would be for the Proposed Action, the major source of NO_x emissions associated with the Partial Facilities Removal Alternative would be off-road construction equipment and other sources of exhaust emissions. The major source of PM₁₀ and PM_{2.5} emissions would be fugitive dust that is generated from

movement on unpaved roads and surfaces. Secondary formation of PM_{2.5} could also occur from NO_x and SO_x emissions; however, these pollutants are not emitted in sufficient quantities to affect the Klamath Falls Nonattainment Area.

The Iron Gate Fish Hatchery would be operated for eight years after the dam removal, but the hatchery would not be rebuilt or relocated. While additional water may be routed to the hatchery to support its operation, an increase in emissions would not occur. Operational emissions were therefore not estimated for the hatchery.

Table 3.9-4 is a summary of predicted uncontrolled peak daily and annual emission rates for VOC, NO_x, CO, SO₂, PM₁₀, and PM_{2.5} for the Partial Facilities Removal Alternative. As Table 3.9-4 shows, total emissions of NO_x and PM₁₀ would exceed the significance criteria for the four sites.

Demolition of Copco 1 dam could generate concrete dust, which has a high pH. Dust control measures as described in mitigation measure AQ-4 would be used to control concrete dust to the maximum extent feasible. Management of the high pH content is discussed further in Section 3.5, Terrestrial Resources. **The impact on air quality from emissions of NO_x and PM₁₀ the Four Facilities would be a significant impact. Implementation of mitigation measures AQ-1 through AQ-4 would reduce emissions of NO_x to a less than significant level; however, emissions of PM₁₀ would remain significant and unavoidable.**

Construction of a new, elevated City of Yreka water supply pipeline and steel pipeline bridge to support the pipe above the river could result in short-term and temporary increases in vehicle exhaust and fugitive dust emissions that could exceed Siskiyou County's thresholds of significance. Air quality impacts associated with the water supply pipeline construction would be the same as those discussed for the Proposed Action. **The impact on air quality from the construction of the Yreka water supply pipeline would be less than significant.**

Activities associated with several IMs could result in short-term and temporary increases in criteria pollutants from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance. Air quality impacts associated with implementation of IMs would be the same as those discussed for the Proposed Action. **The impact on air quality from implementation of the IMs would be less than significant.**

Restoration actions could result in short-term and temporary increases in vehicle exhaust and fugitive dust emissions from the use of helicopters, trucks, and barges. Air quality impacts associated with the restoration actions would be the same as those discussed for the Proposed Action. **Helicopters, trucks, and barges from restoration actions would cause a temporary significant air quality impact and would increase the significant air quality impacts generated by dam deconstruction in and around the dam sites. Available mitigation measures would not reduce emissions to less than significant levels; therefore, emissions would remain significant and unavoidable.**

Table 3.9-4. Uncontrolled Emissions Inventories for the Partial Facilities Removal Alternative

Location	Peak Daily Emissions (pounds per day) ¹					
	VOC	CO	NOx	SO ₂	PM ₁₀	PM _{2.5} ²
Iron Gate	66	270	344	2	208	49
Copco 1	27	173	124	1	171	165
Copco 2	21	80	103	1	12	5
J.C. Boyle	14	48	53	5	94	25
Grand Total	128	570	625	9	484	244
California Total ³	115	522	571	4	390	219
Oregon Total	14	48	53	5	94	25
Significance Criterion ⁴	250	2,500	250	250	250	250
Annual Emissions (tons per year) – 2020						
Iron Gate	3	11	14	<1	10	2
Copco 1	1	7	5	<1	7	7
Copco 2	1	3	4	<1	<1	<1
J.C. Boyle	1	2	3	<1	2	1
Total (2020)	6	23	26	<1	20	11
California Total	5	21	23	<1	17	10
Oregon Total	1	2	3	<1	2	1
De Minimis Threshold ⁵	n/a	100	100	100	100	100

Notes:

¹ Values shown in **bold** are significant.

² Where emission factors were only provided for PM₁₀, appropriate PM size profiles were used to estimate PM_{2.5} emissions. Appendix M includes detailed calculation tables.

³ California total includes emissions for activities at Iron Gate, Copco 1, and Copco 2 Dams.

⁴ Based on Siskiyou County Air Pollution Control District Rule 6.1 permitting thresholds.

⁵ General conformity de minimis thresholds from 40 CFR 93.153.

Key:

VOC = volatile organic compounds

CO = carbon monoxide

NOx = nitrogen oxides

SO₂ = sulfur dioxide

PM₁₀ = inhalable particulate matter

PM_{2.5} = fine particulate matter

*Relocation and demolition of various recreation facilities could result in short-term and temporary increases in vehicle exhaust and fugitive dust emissions. Air quality impacts associated with the recreation facilities would be the same as those discussed for the Proposed Action. **The impact on air quality from the relocation and demolition of the various recreation facilities would be less than significant.***

Vehicle exhaust and fugitive dust emissions from dam removal activities could exceed the de minimis thresholds in 40 CFR 93.153 that would require the development of a general conformity determination. Emissions from trucks and employee commuting could occur within the Klamath Falls UGB, the Klamath Falls Nonattainment Area (PM_{2.5}), or the Medford-Ashland AQMA; therefore, emissions that would occur within these areas are subject to the requirements of general conformity. If the total of direct and indirect emissions are below the general conformity de minimis thresholds in 40 CFR 93.153, then no further action is needed and a general conformity determination is not required.

While only emissions that would occur within the designated nonattainment or maintenance areas would be subject to general conformity, it is not possible to separate those emissions from the project total. As a result, total emissions from haul trucks and employee commuting was compared to the general conformity de minimis thresholds as a conservative analysis. Emissions from trucks and employee commuting are less than the general conformity de minimis thresholds identified in Section 3.9.2.1 (see Table 3.9-4) and therefore a conformity determination is not necessary for any of the maintenance or nonattainment areas. **As a result, a general conformity determination is not required.**

Fugitive dust emissions from demolition activities could impair visibility in Federal Class I areas. Demolition activities would be conducted in compliance with Oregon and California regulations related to fugitive dust emissions. In addition, any fugitive dust emissions would be short-term and temporary and would not have long-term effects related to visibility. **Impacts related to visibility would be less than significant.**

Keno Transfer

The effects of the Keno Transfer would be the same as those for the Proposed Action.

East and West Side Facility Decommissioning

The effects of the East and West Side Facilities removal would be the same as those described for the Proposed Action.

KBRA

The effects of implementing the KBRA would be the same as those described in the Proposed Action.

Alternative 4: Fish Passage at Four Dams Alternative

The Fish Passage at Four Dams Alternative would not include removal of dams, but would instead include construction of fish passages. Under this alternative, fugitive dust emissions would be caused by movement of construction equipment on the soil and internal haul roads, but not by cut/fill activities, which would not occur.

Vehicle exhaust and fugitive dust emissions from construction of fish passage could increase emissions of VOC, NO_x, CO, SO₂, PM₁₀, and PM_{2.5} to levels that could exceed Siskiyou County's thresholds of significance. Table 3.9-5 is a summary of predicted uncontrolled peak daily and annual emission rates for VOC, NO_x, CO, SO₂, PM₁₀, and PM_{2.5} for the Fish Passage at Four Dams Alternative. As Table 3.9-5 shows, maximum daily emissions for all pollutants would not exceed the thresholds of significance. **The**

impact on air quality from emissions of VOC, NO_x, CO, SO₂, PM₁₀, and PM_{2.5} at the Four Facilities would be a less than significant impact.

Table 3.9-5. Uncontrolled Emissions Inventories for the Fish Passage at Four Dams Alternative

Location	Peak Daily Emissions (pounds per day)					
	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5} ¹
Iron Gate	11	63	59	<1	8	3
Copco 1	10	58	45	<1	5	2
Copco 2	10	58	50	<1	5	2
J.C. Boyle	9	16	50	4	11	6
Maximum ²	11	63	59	4	11	6
Significance Criterion ³	250	2,500	250	250	250	250
Annual Emissions (tons per year)						
Iron Gate (2023)	2	10	5	<1	2	1
Copco 1 (2025)	1	7	3	<1	2	<1
Copco 2 (2024)	1	4	1	<1	1	<1
J.C. Boyle (2022)	<1	<1	2	<1	1	<1
Total (2022-2025)	4	22	11	<1	6	1
Maximum	2	10	5	<1	2	1
De Minimis Threshold ⁴	n/a	100	100	100	100	100

Notes:

¹ Where emission factors were only provided for PM₁₀, appropriate PM size profiles were used to estimate PM_{2.5} emissions. Appendix M includes detailed calculation tables.

² Since demolition activities for each dam site occurs during different years and do not overlap, the maximum daily emissions from each dam site are used to evaluate significance.

³ Based on Siskiyou County Air Pollution Control District Rule 6.1 permitting thresholds.

⁴ General conformity de minimis thresholds from 40 CFR 93.153.

Key:

VOC = volatile organic compounds

CO = carbon monoxide

NO_x = nitrogen oxides

SO₂ = sulfur dioxide

PM₁₀ = inhalable particulate matter

PM_{2.5} = fine particulate matter

Vehicle exhaust and fugitive dust emissions from dam removal activities could exceed the de minimis thresholds in 40 CFR 93.153 that would require the development of a general conformity determination. Emissions from trucks and employee commuting could occur within the Klamath Falls UGB, the Klamath Falls Nonattainment Area (PM_{2.5}), or the Medford-Ashland AQMA; therefore, emissions that would occur within these areas are subject to the requirements of general conformity. If the total of direct and indirect emissions are below the general conformity de minimis thresholds in 40 CFR 93.153, then no further action is needed and a general conformity determination is not required.

While only emissions that would occur within the designated nonattainment or maintenance areas would be subject to general conformity, it is not possible to separate

those emissions from the project total. As a result, total emissions from haul trucks and employee commuting was compared to the general conformity de minimis thresholds as a conservative analysis. Emissions from trucks and employee commuting are less than the general conformity de minimis thresholds identified in Section 3.9.2.1 (see Table 3.9-5) and therefore a conformity determination is not necessary for any of the maintenance or nonattainment areas. **As a result, a general conformity determination is not required.**

Fugitive dust emissions from construction activities could impair visibility in Federal Class I areas. Construction activities would be conducted in compliance with Oregon and California regulations related to fugitive dust emissions. In addition, any fugitive dust emissions would be short-term and temporary and would not have long-term effects related to visibility. **Impacts related to visibility would be less than significant.**

Trap and Haul – Programmatic Measure

Implementation of trap and haul measures could result in temporary increases in air quality pollutant emissions from vehicle exhaust. Potential operational emissions could occur from haul trucks moving fish around Keno Impoundment and Link River. Upstream-migrating fish would be collected downstream from Keno Dam and relocated upstream from Link River Dam. Downstream-migrating fish would be collected at Link River Dam (and the East Side and West Side canals) and relocated downstream from Keno Dam. Seasonal trap and haul operations would occur during periods of poor water quality in Keno Impoundment. **Although the exact extent and timing of these hauling activities is not known, it is assumed that air quality impacts from the trap and haul measures would be significant because of the long haul distance that is expected. Mitigation Measures AQ-1, 2, and 3 would be implemented to reduce the severity of these effects to a less than significant level.**

Alternative 5: Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative

The Fish Passage at Two Dams Alternative would include removal of Copco 1 and Iron Gate Dams, but would leave Copco 2 and J.C. Boyle Dams in place with newly constructed fish passages. This alternative would essentially be a combination of the Proposed Action (Full Facilities Removal) and the Fish Passage at Four Dams Alternative, with similar emissions sources.

Vehicle exhaust and fugitive dust emissions could increase emissions of VOC, NO_x, CO, SO₂, PM₁₀, and PM_{2.5} to levels that could exceed Siskiyou County's thresholds of significance. Table 3.9-6 is a summary of predicted uncontrolled peak daily and annual emission rates for VOC, NO_x, CO, SO₂, PM₁₀, and PM_{2.5} for the Fish Passage at Four Dams Alternative. The Iron Gate Fish Hatchery would be operated for eight years after the dam removal, but the hatchery would not be rebuilt or relocated. While additional water may be routed to the hatchery to support its operation, an increase in emissions would not occur. Operational emissions were therefore not estimated for the hatchery. As Table 3.9-6 shows, total emissions of NO_x and PM₁₀ would exceed the significance criterion for the four sites.

Table 3.9-6. Uncontrolled Emissions Inventories for the Fish Passage at Two Dams, Remove Copco 1 and Iron Gate Alternative

Location	Peak Daily Emissions (pounds per day) ¹					
	VOC	CO	NOx	SO ₂	PM ₁₀	PM _{2.5} ²
Iron Gate	67	282	345	2	209	49
Copco 1	28	179	129	1	173	165
Copco 2	12	61	82	<1	6	4
J.C. Boyle	10	32	63	4	11	7
Grand Total	117	552	620	7	399	225
California Total ³	107	521	557	3	388	218
Oregon Total	10	32	63	4	11	7
Significance Criterion ⁴	250	2,500	250	250	250	250
Annual Emissions (tons per year) – 2020						
Iron Gate	3	12	14	<1	10	2
Copco 1	1	7	5	<1	8	7
Copco 2	<1	1	1	<1	<1	<1
J.C. Boyle	<1	1	2	<1	<1	<1
Total (2020)	4	20	22	<1	18	10
California Total	4	19	20	<1	17	10
Oregon Total	<1	1	2	<1	<1	<1
De Minimis Threshold ⁵	n/a	100	100	100	100	100

Notes:

¹ Values shown in **bold** are significant.

² Where emission factors were only provided for PM₁₀, appropriate PM size profiles were used to estimate PM_{2.5} emissions. Appendix M includes detailed calculation tables.

³ California total includes emissions for activities at Iron Gate, Copco 1, and Copco 2 Dams.

⁴ Based on Siskiyou County Air Pollution Control District Rule 6.1 permitting thresholds.

⁵ General conformity de minimis thresholds from 40 CFR 93.153.

Key:

VOC = volatile organic compounds

CO = carbon monoxide

NOx = nitrogen oxides

SO₂ = sulfur dioxide

PM₁₀ = inhalable particulate matter

PM_{2.5} = fine particulate matter

Demolition of Copco 1 Dam could generate concrete dust, which has a high pH. Dust control measures as described in mitigation measure AQ-4 would be used to control concrete dust to the maximum extent feasible. Management of the high pH content is discussed further in Section 3.5, Terrestrial Resources. **The impact on air quality from emissions of NOx and PM₁₀ from construction work at the Four Facilities would be a significant impact. Implementation of mitigation measures AQ-1 through AQ-4 would reduce emissions to a less than significant level.**

Construction of a new, elevated City of Yreka water supply pipeline and steel pipeline bridge to support the pipe above the river could result in short-term and temporary

increases in vehicle exhaust and fugitive dust emissions. Air quality impacts associated with the Yreka water supply pipeline would be the same as those described for the Proposed Action. **The impact on air quality from the construction of the Yreka water supply pipeline would be less than significant.**

Restoration actions could result in short-term and temporary increases in vehicle exhaust and fugitive dust emissions from the use of helicopters, trucks, and barges. Air quality impacts related to restoration activities would be similar to those described for the Proposed Action but would only occur near the Iron Gate and Copco 1 Dam sites.

Helicopters, trucks, and barges from restoration actions would cause a temporary significant air quality impact and would increase the significant air quality impacts generated by dam deconstruction in and around the dam sites. Available mitigation measures, including AQ-1 through AQ-3, are not expected to reduce emissions to less than significant levels; therefore, emissions would remain significant and unavoidable.

Relocation and demolition of various recreation facilities could result in short-term and temporary increases in vehicle exhaust and fugitive dust emissions. Recreation facilities near J.C. Boyle Reservoir would stay intact, and the Copco 2 area does not have any developed recreation facilities. Recreation facilities at Iron Gate and Copco 1 would be removed. As with the Proposed Action, the amount of equipment expected to be used simultaneously is expected to be minimal; therefore, peak daily emissions are not expected to exceed the significance criteria described previously. **The impact on air quality from the relocation and demolition of the various recreation facilities would be less than significant.**

Vehicle exhaust and fugitive dust emissions from dam removal activities could exceed the de minimis thresholds in 40 CFR 93.153 that would require the development of a general conformity determination. Emissions from trucks and employee commuting could occur within the Klamath Falls UGB, the Klamath Falls Nonattainment Area (PM_{2.5}), or the Medford-Ashland AQMA; therefore, emissions that would occur within these areas are subject to the requirements of general conformity. If the total of direct and indirect emissions are below the general conformity de minimis thresholds in 40 CFR 93.153, then no further action is needed and a general conformity determination is not required.

While only emissions that would occur within the designated nonattainment or maintenance areas would be subject to general conformity, it is not possible to separate those emissions from the project total. As a result, total emissions from haul trucks and employee commuting was compared to the general conformity de minimis thresholds as a conservative analysis. Emissions from trucks and employee commuting are less than the general conformity de minimis thresholds identified in Section 3.9.2.1 (see Table 3.9-6) and therefore a conformity determination is not necessary for any of the maintenance or nonattainment areas. **As a result, a general conformity determination is not required.**

Fugitive dust emissions from construction and demolition activities could impair visibility in Federal Class I areas. Construction and demolition activities would be conducted in

compliance with Oregon and California regulations related to fugitive dust emissions. In addition, any fugitive dust emissions would be short-term and temporary and would not have long-term effects related to visibility. **Impacts related to visibility would be less than significant.**

Trap and Haul – Programmatic Measure

Implementation of trap and haul measures could result in temporary increases in air quality pollutant emissions from vehicle exhaust. The trap and haul measures around Keno Impoundment and Link River would have the same impacts under the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative as the Fish Passage at Four Dams Alternative. **Although the exact extent and timing of these hauling activities is not known, it is assumed that air quality impacts from the trap and haul measures would be significant because of the long haul distance that is expected. Mitigation Measures AQ-1, 2, and 3 would be implemented to reduce the severity of these effects to a less than significant level.**

3.9.4.4 Mitigation Measures

Mitigation Measure by Consequence Summary

AQ-1 – Any off-road construction equipment (e.g., loaders, excavators, etc.) must be equipped with engines that meet the model year (MY) 2015 emission standards for off-road compression-ignition (diesel) engines (13 CCR 2420-2425.1). Older model year engines may also be used if they are retrofit with control devices to reduce emissions to the applicable emission standards.

AQ-2 – Any on-road construction equipment (e.g., pick-up trucks at the construction sites) must be equipped with engines that meet the MY 2000 or on-road emission standards.

AQ-3 – Any trucks used to transport materials to or from the construction sites must be equipped with engines that meet the MY 2010 or later emission standards for on-road heavy-duty engines and vehicles (13 CCR 1956.8). Older model engines may also be used if they are retrofit with control devices to reduce emissions to the applicable emission standards.

AQ-4 – Dust control measures will be incorporated to the maximum extent feasible during blasting operations at Copco 1 Dam. The following control measures will be used during blasting activities:

- Conduct blasting on calm days to the extent feasible. Wind direction with respect to nearby residences must be considered.
- Design blast stemming to minimize dust and to control fly rock.
- Install wind fence for control of windblown dust

Effectiveness of Mitigation in Reducing Consequence

Implementation of the various engine control measures (AQ-1, AQ-2, AQ-3, and AQ-4) would substantially reduce NO_x and PM₁₀ emissions; however, the extent of the reduction would vary based on the size (horsepower), age, and type of equipment⁴. Controlling emissions from equipment operating on the construction site, including both off-road construction equipment (AQ-1) and on-road pick-up trucks (AQ-2), would reduce NO_x and PM₁₀ emissions by over 80 percent each. Controlling emissions from on-road heavy-duty diesel trucks could also reduce NO_x emissions by approximately 20 percent or more. The effectiveness of AQ-4 cannot be quantified, but the mitigation would minimize PM₁₀ and PM_{2.5} emissions that would occur during blasting operations at Copco 1. Table 3.9-7 summarizes the expected emissions after mitigation.

Table 3.9-7. Summary of Mitigated Emissions by Alternative

Alternative ¹	Peak Daily Emissions (pounds/day)					
	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}
Full Facilities Removal	66	405	146	3	309	74
Partial Facilities Removal	64	394	137	3	294	60
Fish Passage at Two Dams	54	372	156	3	209	44
Significance Criterion ²	250	2,500	250	250	250	250

Notes:

¹ Alternative 4 (Fish Passage at Four Dams) not shown in Table because mitigation was not required.

² Based on Siskiyou County Air Pollution Control District Rule 6.1 permitting thresholds.

Key:

VOC = volatile organic compounds

CO = carbon monoxide

NO_x = nitrogen oxides

SO₂ = sulfur dioxide

PM₁₀ = inhalable particulate matter

PM_{2.5} = fine particulate matter

Agency Responsible for Mitigation Implementation

The Dam Removal Entity would be responsible for implementing mitigation measures AQ-1 through AQ-3.

Remaining Significant Impacts

Following implementation of the mitigation measures specified for a given alternative, PM₁₀ emissions would remain significant and unavoidable for the Proposed Action and the Partial Facilities Removal Alternative.

⁴ The vehicular emission factor models used in this analysis, specifically EMFAC2007 for on-road emissions and OFFROAD2007 for off-road emissions in California, assume a specific fleet mix of vehicles. For example, by default, EMFAC2007 contains emission factors and vehicle activity data for model years 1965 through 2040 for each vehicle class. When the model is run for a specific calendar year, then it makes assumptions about the percentage of vehicles for each model year, fuel type, and vehicle class would be operating. As a result, the default model assumptions would contain a mix of vehicles from model year 1965 to 2020 (year of construction).

Mitigation Measures Associated with Other Resource Areas

Transporting fish and mollusks under Mitigation Measures AR-1, 2, 5-7 could cause temporary increases in criteria pollutants. These mitigation measures would involve trap and haul of fish and mollusks to protect them from the reservoir drawdown and dam demolition activities. It is anticipated that as many as 150 truck trips would be required to transport juveniles from areas downstream of Iron Gate Dam to the confluence of the Klamath and Trinity Rivers between February and April 2020. The increase in daily truck trips would be minor (approximately 2 trips per day) and would not contribute substantially to the existing emissions. **The air quality impacts associated with these mitigation measures would be less than significant.**

Construction activities associated with Mitigation Measure TR-1 could cause a temporary increase in vehicle exhaust and fugitive dust emissions. Relocation of Jenny Creek Bridge and culverts near Iron Gate Reservoir would occur before the other construction phases of dam removal. On- and off-road construction equipment would be used to complete the necessary construction, but would be minor compared to the dam demolition emissions. **Air quality impacts associated with Mitigation Measure TR-1 would be less than significant.**

Several other mitigation measures may require construction, including Mitigation Measure H-2 (move or elevate structures with flood risk), GW-1 (deepen or replace wells), REC-1 (replacement of recreational facilities), and WRWS-1 (modify water intakes). These measures could produce temporary impacts on air quality during construction activities within localized areas. These activities would take place before or after the primary construction and deconstruction activities associated with the Proposed Action and action alternatives. The same or similar elements as for the Proposed Action and action alternatives would be incorporated into these construction activities to avoid or reduce impacts on air quality. **Mitigation Measures AQ-1 through AQ-3 would be implemented, as necessary, to avoid or reduce impacts as under the Proposed Action. Therefore, impacts on air quality from the implementation of H02, GW-1, REC-1, and WRWS-1 would be less than significant.**

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